

What is claimed is:

1. A method of making a medical device, the method comprising:
  - providing an elongated shaft defining a surface;
  - providing a structural member comprising a metallic material having a predetermined melting point temperature above which the material can flow;
  - disposing the structural member adjacent the elongated shaft such that at least a portion of the structural member is adjacent the surface;
  - heating a discrete portion of the structural member to a temperature at or above the predetermined melting point temperature;
  - allowing the heated portion of the structural member to flow onto the surface of the elongated shaft; and
  - allowing the heated portion of the structural member to cool on the surface of the elongated shaft such that a discrete connection area is created forming a mechanical bond between the structural member and the elongated shaft.
2. The method of claim 1, wherein the structural member comprises a tubular member defining a lumen and having an inner surface, and the disposing includes disposing the structural member about the elongated shaft such that at least a portion of the elongated shaft is disposed within the lumen of the structural member.
3. The method of claim 2, wherein the structural member comprises a helical coil.
4. The method of claim 2, wherein the structural member comprises a tubular member.
5. The method of claim 2, wherein the tubular member includes a perimeter, and the discrete connection area extends about the perimeter of a portion of the tubular member.

6. The method of claim 2, wherein the tubular member includes a perimeter, and the discrete connection extends about only a portion of the perimeter of a portion of the tubular member.

7. The method of claim 1, wherein the elongated shaft comprises a material having a second predetermined melting point temperature above which the material can flow, and the second predetermined melting point temperature is greater than the first predetermined melting point temperature.

8. The method of claim 1, wherein the elongated shaft comprises a material having characteristics that are adversely affected when exposed to a second predetermined temperature, and the second predetermined temperature is greater than the first predetermined melting point temperature.

9. The method of claim 1, wherein the elongated shaft comprises a metallic material.

10. The method of claim 1, wherein the elongated shaft comprises stainless steel or a nickel-titanium alloy, and wherein the structural member comprises a nickel-titanium alloy, tungsten, platinum, MP35-N, elgiloy, hastelloy, or combinations or alloys thereof.

11. The method of claim 1, wherein the heating of the discrete portion of the structural member comprises heating with LASER energy.

12. The method of claim 1, wherein the elongated shaft comprises a material having a melting point, and the heating step includes avoiding heating of the material of the elongated shaft to the melting point thereof.

13. The method of claim 1, wherein the elongated shaft comprises a material, and wherein the discrete connection area is created to form the mechanical bond between the structural member and the elongated shaft is achieved without the intermixing in a fluid state of material from the elongated shaft and material from the structural member.

14. The method of claim 1, wherein the discrete connection area is created to form the mechanical bond between the structural member without the use of an additional bonding material.

15. The method of claim 1, wherein a plurality of discrete connection areas are created to form the mechanical bond between the structural member and the elongated shaft.

16. A method of making a medical device, the method comprising:  
providing an elongated shaft comprising a material and defining a surface;  
providing a structural member comprising a metallic material having a predetermined melting point temperature above which the material can flow;  
disposing the structural member adjacent the elongated shaft such that at least a portion of the structural member is adjacent the surface;  
heating a portion of the structural member to a temperature at or above the predetermined melting point temperature;  
allowing at least a part of the heated portion of the structural member to flow onto the surface of the elongated shaft; and  
allowing the heated portion of the structural member to cool on the surface of the elongated shaft such that a mechanical bond is formed between the structural member and the elongated shaft, wherein the mechanical bond is achieved without the intermixing in a fluid state of material from the elongated shaft and material from the structural member.

17. The method of claim 16, wherein the mechanical bond is achieved without the use of an additional bonding material.

18. The method of claim 16, wherein the elongated shaft comprises a material having a second predetermined melting point temperature, and wherein heating includes heating a discrete portion of the structural member to a temperature at or above the predetermined melting point temperature while avoiding heating the elongated shaft to the second predetermined melting point temperature; and the heated portion of the structural member is allowed to cool on the surface of the elongated shaft such that a discrete connection area is created forming a mechanical bond between the structural member and the elongated shaft.

19. A method of making a medical device, the method comprising:  
providing an elongated shaft defining a surface;  
providing a structural member comprising a material having a predetermined melting point temperature above which the material flows;  
disposing the structural member on the elongated shaft such that at least a portion of the structural member is adjacent the surface;  
using LASER energy to heat the portion of the structural member to a temperature at or above the predetermined melting point temperature;  
allowing the heated portion of the structural member to flow onto the surface of the elongated shaft; and  
allowing the heated portion of the structural member to cool on the surface of the elongated shaft such that a mechanical bond is formed between the structural member and the elongated shaft.

20. The method of claim 19, wherein the mechanical bond is achieved without the intermixing in a fluid state of material from the elongated shaft and material from the structural member.

21. The method of claim 19, wherein the structural member comprises a metallic material.

22. A method of making a guidewire, the method comprising:
  - providing an elongated core wire defining an outer surface;
  - providing a tubular member defining a lumen and having an inner surface, the tubular member comprising a metallic material having a predetermined melting point temperature above which the material can flow;
  - disposing a portion of the elongated core wire within the lumen of the tubular member such that at least a portion of the inner surface of the tubular member is adjacent the outer surface of the core wire;
  - heating a portion of the tubular member to a temperature at or above the predetermined melting point temperature of the metallic material;
  - allowing a part of the heated portion of the tubular member to flow onto the outer surface of the core wire; and
  - allowing the heated portion of the tubular member to cool such that the part disposed on the outer surface of the core wire forms a mechanical bond between the tubular member and the core wire.
23. The method of claim 22, wherein the tubular member comprises a helical coil.
24. The method of claim 22, wherein the tubular member comprises a hypotube.
25. The method of claim 22, wherein the heating includes heating a discrete portion of the tubular member to a temperature at or above the predetermined melting point temperature, and the heated portion of the structural member is allowed to cool on the surface of the elongated shaft such that a discrete connection area is created forming the mechanical bond between the tubular member and the core wire.

26. The method of claim 25, wherein the tubular member includes a perimeter, and the discrete connection area extends about the perimeter of a portion of the tubular member.

27. The method of claim 25, wherein the tubular member includes a perimeter, and the discrete connection extends about only a portion of the perimeter of a portion of the tubular member.

28. The method of claim 22, wherein the core wire comprises a material having a second predetermined melting point temperature above which the material can flow, and the second predetermined melting point temperature is greater than the first predetermined melting point temperature, and wherein the heating includes avoiding heating the core wire to the second predetermined melting point temperature.

29. The method of claim 22, wherein the core wire comprises a metallic material.

30. The method of claim 22, wherein the core wire comprises stainless steel or a nickel-titanium alloy, and wherein the tubular member comprises a nickel-titanium alloy, tungsten, platinum, MP35-N, elgiloy, hastelloy, or combinations or alloys thereof.

31. The method of claim 22, wherein the heating of the portion of the structural member comprises heating with LASER energy.

32. The method of claim 22, wherein the core wire comprises a material, and wherein the mechanical bond between the core wire and the tubular member is achieved without the intermixing in a fluid state of material from the core wire with material from the tubular member.

33. The method of claim 25, wherein a plurality of discrete connection areas are created to form the mechanical bond between the tubular member and the core wire.

34. A method of making a guidewire, the method comprising:

- providing an elongated core wire comprising a material and defining an outer surface;
- providing a tubular member comprising a material and defining a lumen and having an inner surface;
- disposing a portion of the elongated core wire within the lumen of the tubular member such that at least a portion of the inner surface of the tubular member is adjacent the outer surface of the core wire; and
- providing means for creating a mechanical bond between the tubular member and the core wire without the intermixing in a fluid state of material from the core wire with material from the tubular member, and without the use of an additional bonding material.

35. A medical device comprising:

- an elongated shaft comprising a material and defining a surface;
- a structural member comprising a metallic material having a predetermined melting point temperature above which the material can flow, the structural member disposed adjacent the elongated shaft such that at least a portion of the structural member is adjacent the surface; and
- a discrete connection area forming a mechanical bond between the structural member and the elongated shaft, the discrete connection area including a portion of the structural member that was heated, allowed to flow onto and allowed to cool on the surface of the elongated shaft without intermixing in a fluid state with material from the elongated shaft.

36. The medical device of claim 35, wherein the structural member comprises a tubular member defining a lumen and having an inner surface, and the structural member is disposed about the elongated shaft such that at least a portion of the elongated shaft is disposed within the lumen of the structural member.

37. The medical device of claim 36, wherein the tubular member comprises a helical coil.

38. The medical device of claim 36, wherein the tubular member comprises a hypotube.

39. The medical device of claim 36, wherein the tubular member includes a perimeter, and the discrete connection area extends about the perimeter of a portion of the tubular member.

40. The medical device of claim 36, wherein the tubular member includes a perimeter, and the discrete connection extends about only a portion of the perimeter of a portion of the tubular member.

41. The medical device of claim 35, wherein the elongated shaft comprises a material having a second predetermined melting point temperature above which the material can flow, and the second predetermined melting point temperature is greater than the first predetermined melting point temperature.

42. The medical device of claim 36, wherein the elongated shaft comprises a material having characteristics that are adversely affected when exposed to a second predetermined temperature, and the second predetermined temperature is greater than the first predetermined melting point temperature.

43. The medical device of claim 35, wherein the elongated shaft comprises a metallic material.

44. The medical device of claim 35, wherein the elongated shaft comprises stainless steel or a nickel-titanium alloy, and wherein the structural member comprises a nickel-titanium alloy, tungsten, platinum, MP35-N, elgiloy, hastelloy, or combinations or alloys thereof.

45. The medical device of claim 35, wherein the discrete connection area was formed by heating of the discrete portion of the structural member with LASER energy.

46. The medical device of claim 35, wherein the discrete connection area is created to form the mechanical bond between the structural member without the use of an additional bonding material.

47. The medical device of claim 35, further including a plurality of discrete connection areas.

48. A guidewire comprising:

an elongated core wire comprising a material and defining an outer surface;

a tubular member defining a lumen and having an inner surface, the tubular member comprising a metallic material having a predetermined melting point temperature above which the material can flow, the tubular member being disposed about a portion of the core wire such that the portion of the core wire extends within the lumen of the tubular member such that at least a portion of the inner surface of the tubular member is adjacent the outer surface of the core wire; and

a discrete connection area forming a mechanical bond between the tubular member and the elongated core wire, the discrete connection area including a portion of the tubular member that was heated, allowed to flow onto and allowed to cool on the surface of the core wire without intermixing in a fluid state with material from the core wire.

49. A guidewire comprising:

an elongated core wire comprising a material and defining an outer surface; and

a tubular member defining a lumen and having an inner surface, the tubular member comprising a metallic material having a predetermined melting point temperature above which the material can flow, the tubular member being disposed about a portion of the core wire such that the portion of the core wire extends within the lumen

of the tubular member such that at least a portion of the inner surface of the tubular member is adjacent the outer surface of the core wire;

wherein the tubular member is heat crimped to the elongated core wire such that a mechanical bond is formed between the tubular member and the elongated core wire, wherein the heat crimping is achieved without intermixing in a fluid state of material from the core wire and material from the tubular member.

50. A guidewire comprising:

an elongated core wire comprising a material and defining an outer surface;

a tubular member defining a lumen and having an inner surface, the tubular member comprising a metallic material having a predetermined melting point temperature above which the material can flow, the tubular member being disposed about a portion of the core wire such that the portion of the core wire extends within the lumen of the tubular member such that at least a portion of the inner surface of the tubular member is adjacent the outer surface of the core wire; and

means for connecting the tubular member to the elongated core wire such that a mechanical bond is formed between the tubular member and the elongated core wire, wherein the mechanical bond is achieved without intermixing in a fluid state of material from the core wire and material from the tubular member.